BECKER
AVIONIC SYSTEMS

OPERATING INSTRUCTIONS

BECKER AR 4201 - (O) (GK 415)

portable VHF Transceiver



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Subject to technical changes

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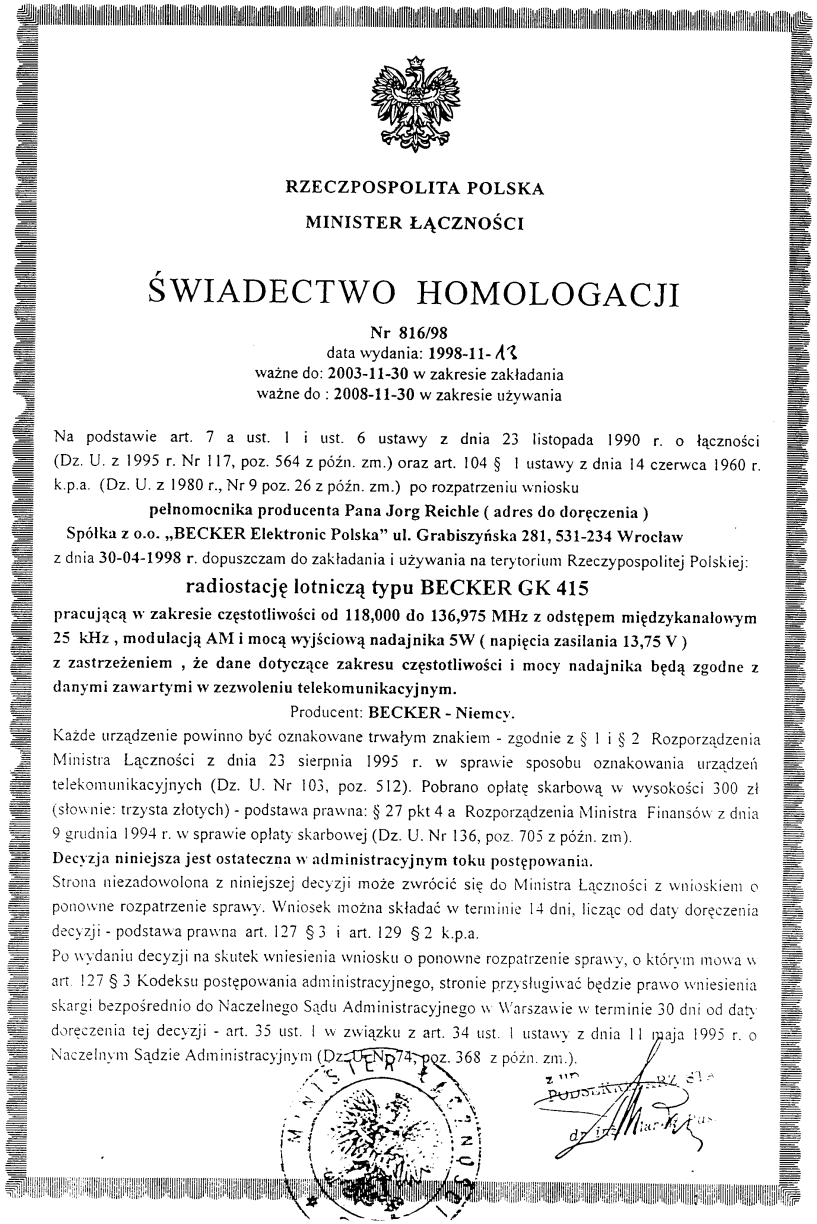
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RZECZPOSPOLITA POLSKA

MINISTER ŁĄCZNOŚCI

ŚWIADECTWO HOMOLOGACJI

Nr 816/98
data wydania: **1998-11-13**
ważne do: **2003-11-30** w zakresie zakładania
ważne do : **2008-11-30** w zakresie używania

Na podstawie art. 7 a ust. 1 i ust. 6 ustawy z dnia 23 listopada 1990 r. o łączności (Dz. U. z 1995 r. Nr 117, poz. 564 z późn. zm.) oraz art. 104 § 1 ustawy z dnia 14 czerwca 1960 r. k.p.a. (Dz. U. z 1980 r., Nr 9 poz. 26 z późn. zm.) po rozpatrzeniu wniosku

pełnomocnika producenta Pana Jorg Reichle (adres do doręczenia)
Spółka z o.o. „BECKER Elektronic Polska" ul. Grabiszyńska 281, 531-234 Wrocław
z dnia **30-04-1998 r.** dopuszczam do zakładania i używania na terytorium Rzeczypospolitej Polskiej:

radiostację lotniczą typu BECKER GK 415

pracującą w zakresie częstotliwości od 118,000 do 136,975 MHz z odstępem międzykanałowym 25 kHz , modulacją AM i mocą wyjściową nadajnika 5W (napięcia zasilania 13,75 V) z zastrzeżeniem , że dane dotyczące zakresu częstotliwości i mocy nadajnika będą zgodne z danymi zawartymi w zezwoleniu telekomunikacyjnym.

Producent: **BECKER - Niemcy.**

Każde urządzenie powinno być oznakowane trwałym znakiem - zgodnie z § 1 i § 2 Rozporządzenia Ministra Łączności z dnia 23 sierpnia 1995 r. w sprawie sposobu oznakowania urządzeń telekomunikacyjnych (Dz. U. Nr 103, poz. 512). Pobrano opłatę skarbową w wysokości 300 zł (słownie: trzysta złotych) - podstawa prawna: § 27 pkt 4 a Rozporządzenia Ministra Finansów z dnia 9 grudnia 1994 r. w sprawie opłaty skarbowej (Dz. U. Nr 136, poz. 705 z późn. zm).

Decyzja niniejsza jest ostateczna w administracyjnym toku postępowania.

Strona niezadowolona z niniejszej decyzji może zwrócić się do Ministra Łączności z wnioskiem o ponowne rozpatrzenie sprawy. Wniosek można składać w terminie 14 dni, licząc od daty doręczenia decyzji - podstawa prawna art. 127 § 3 i art. 129 § 2 k.p.a.

Po wydaniu decyzji na skutek wniesienia wniosku o ponowne rozpatrzenie sprawy, o którym mowa w art. 127 § 3 Kodeksu postępowania administracyjnego, stronie przysługiwać będzie prawo wniesienia skargi bezpośrednio do Naczelnego Sądu Administracyjnego w Warszawie w terminie 30 dni od daty doręczenia tej decyzji - art. 35 ust. 1 w związku z art. 34 ust. 1 ustawy z dnia 11 maja 1995 r. o Naczelnym Sądzie Administracyjnym (Dz. U. Nr 74, poz. 368 z późn. zm.).

Important

Carefully read these operating instructions right through before attempting to operate the portable VHF station.

Keep these operating instructions carefully. They contain important safety and operating instructions for the portable VHF station.

Introduction

Thank you for purchasing the BECKER portable VHF station. The technology used is to the state of the art.

To fully utilise the capabilities of your portable VHF station, please carefully read these operating instructions right through before you start operating the set.

If you have any questions regarding the operation of the portable VHF station, please get in touch with your nearest Becker Dealer or with the Becker Customer Service.

The CAUTION, WARNING and NOTE highlights have the following meanings:

WARNING	Failure to comply, or incorrect compliance, with these instructions or procedures can lead to injuries or fatal accidents.
CAUTION	Failure to comply, or incorrect compliance, with these instructions or procedures can lead to damage to equipment.
NOTE	Feature to which attention should be drawn.

Safety information

CAUTION

- Never connect the portable VHF station to alternating current voltage or to voltage sources exceeding 32 V.d.c.
- Never connect the portable VHF station with reversed polarity to a voltage source.
- The installation or use of the portable VHF station in ambient temperatures below -15° C or above +50° C is to be avoided.

Anlage 1 zur Zulassungsurkunde Zulassungsnummer: A107417D Datum: 07.10.99 Seite 1 (1)	Annex 1 of the Approval Certificate Approval No.: A107417D Date: 07.10.99 Page 1 of 1

Systembeschreibung

OBJEKTBESTANDTEILE:

VHF-Sprechfunkanlage „**AR 4201**“ (Sende-Empfänger) mit Bedien- und Anzeigeteil

OBJEKTMERKMALE :

Frequenzbereich	:	**118,000 MHz ... 136,975 MHz**
RF-Ausgangsleistung	:	**5,5 W**
Sendeart	:	**A3E**
Modulationsgrad	:	**85%**
Betriebskanäle	:	**760**
Kanalraster	:	**25 kHz**
Spannungsversorgung	:	**10,0 V DC (Notbetrieb) bzw.** **12,4 V DC ... 15,6 V DC**

Bedingungen und Auflagen :

Die Bedingungen und Auflagen sind der „Verordnung über die Zulassung von Telekommunikationseinrichtungen (TKZulV) vom September 1992 zu entnehmen .

Außerdem gilt :

1. Das Zulassungsobjekt muß vom Zulassungsinhaber wie folgt gekennzeichnet werden :
   - Zulassungszeichen
   - zusätzliche Kennzeichnung
   - Objektbezeichnung
   - Zulassungsinhaber
   - Seriennummer / Gerätenummer

   Die zusätzlichen Kennzeichen sind dem Zulassungszeichen außerhalb der Umrandung rechts unten in gleicher Schrift und in Höhe der Jahresangabe anzufügen .
2. Es dürfen nur solche Objekte mit den Zulassungszeichen gekennzeichnet werden , die mit dem zugelassenen Objekt elektrisch und mechanisch übereinstimmen , d.h. bau- und funktionsgleich sind.
3. Der Zulassungsinhaber ist verpflichtet , jedem mit dem Zulassungszeichen gekennzeichneten Objekt einen Nachdruck dieser Zulassungsurkunde beizufügen .
4. Dem Zulassungsinhaber ist es untersagt , für einen Betrieb des Zulassungsobjektes zu werben , der nicht in Übereinstimmung mit den technischen Vorschriften und dem Verwendungszweck steht.
5. Alle an die Funkanlage anschließbaren Zusatzgeräte müssen nach der Norm EN 55022 Grenzwertklasse B funkentstört sein.

Hinweise

- Diese Zulassung ist keine Frequenzzuteilung im Sinne des §47 des Telekommunikationsgesetzes (TKG) .
- Funkanlagen , die in Luftfahrzeugen errichtet und betrieben werden sollen , müssen ferner die vom Luftfahrt-Bundesamt (LBA) festgelegten Lufttüchtigkeitsforderungen erfüllen und gemäß Luftverkehrs - Zulassungs - Ordnung als Muster zugelassen sein . Die Musterzulassung erteilt das LBA .
- Die Bestimmungen der Verordnung über die Flugsicherungsausrüstung der Luftfahrzeuge (FSAV) bleiben von dieser Zulassung unberührt .

*****

CETECOM ICT Services GmbH

beliehen nach der Beleihungs- und Akkreditierungsverordnung vom 10. Dezember 1997
als Benannte Stelle der Bundesrepublik Deutschland, vertreten durch die
recognised in accordance with the Recognition and Accreditation Ordinance of December 10, 1997
as Notified Body for the Federal Republic of Germany, represented by

Regulierungsbehörde für
Telekommunikation und Post

ZULASSUNGSURKUNDE
APPROVAL CERTIFICATE

Zulassungsnummer: Approval Number:	**A107417D**
Zusätzl. Kennzeichen: Additional Sign:	**LB** oder **LO**
Objektbezeichnung: Object Designation:	**AR 4201**
Zulassungsinhaber: Approval Holder:	**Becker Flugfunkwerk GmbH** **Baden Airpark, Gebäude B 108** **D-77836 Rheinmünster**
Zulassungsart: Type of Approval:	**Allgemeinzulassung**
Befristung: Limitation:	**unbefristet**
Objektart: Type of Object:	**Funkanlage des beweglichen Flugfunks in Bodenfunkstellen oder an Bord eines Luftfahrzeuges als VHF-Sprechfunkanlage.**

Das Zulassungsobjekt erfüllt die technischen Vorschriften der Richtlinien FTZ 17 TR 2010, Ausgabe März 1988 und FTZ 17 TR 2013, Ausgabe Juni 1989

Diese Urkunde ersetzt die Urkunde vom 23.09.93 mit gleicher Zulassungsnummer, ausgestellt vom Bundesamt für Zulassungen in der Telekommunikation (BZT).
This certificate takes the place of the certificate from 23.09.93 with the same approval number, issued by the BZT.

Diese Urkunde ist erstellt in Übereinstimmung mit § 21 der Telekommunikationszulassungsverordnung vom 20. August 1997 und gilt nur in Verbindung mit der nachfolgenden **Anzahl** von Anlagen.
The certificate is issued in accordance with § 21 of the Telecommunications Approval Ordinance from August 20, 1997 and is only valid in conjunction with the following **number** of annexes

Anzahl der Anlagen: **1**
Number of annexes:

Saarbrücken, 07.10.99
Ort, Ausstellungsdatum
Place, Date of Issue

Unterzeichnet von / Signed by Michael Klos
Benannte Stelle / Notified Body

GERMAN NOTIFIED BODY · DEUTSCHE BENANNTE STELLE ·

CETECOM ICT Services GmbH, Untertürkheimer Straße 6-10, D-66117 Saarbrücken, Germany

Additional information

- A speech test is to be performed before startup and it should be noted that if the speech test is carried out close to the portable VHF station the results may be positive even if the antenna cable is broken or short-circuited. At a distance of 5 to 10 km no connection will be made.
- Use a loud voice for speech communication and hold the microphone close to the lips. Otherwise noise can be intrusive and make understanding difficult.
- Use only microphones or headsets which are suitable for use in aircraft. Incoming radiation on the equipment antenna can affect the integrated amplifier of the microphone (feedback). This is noticeable in the portable VHF station by whistling and/or heavy distortion. The described disturbances can occur in different ways on the different transmission channels.
- he PTT (press to transmit) button can stick and cause continuous transmission. Therefore, when transmitting observe the arrow in the top line on the left next to the active frequency display and check that when the PTT is released the arrow disappears.
- The fuse may be replaced only by the specified fuse, otherwise uncontrolled damage can occur at the VHF transceiver.

General information

Carrying case and transceiver together form a portable VHF station. The easily-portable VHF station can be used, for example, for mobile and fixed operations on airfields or landing strips. It an also be used in hot air balloons, for ferrying aircraft or or recovery of gliders.

The carrying case contains the battery, speaker, antenna socket, the way diode connecting socket for the microphone or microphone speaker and the voltage converter. A microphone/speaker, a headset or a helmet (ultralight) can be connected to the 5-way diode socket. The built-in battery is a maintenance-free rechargeable 12 V / 2.2 Ah dry lead battery.

The battery can be charged via the external d.c. socket. The charging voltage can be varied between 10 V and 32 V. The charging time for a heavily discharged battery is approximately 8 hours. The nominal operating time for the portable VHF station is approximately 6 hours at a keying ratio of 1:10 normal radio traffic) and transmitter output power of 5 W. Reception is then still guaranteed for a further 2 hours.

The portable VHF station contains a monitoring stage for the battery voltage which is activated when the unit is switched on. If the battery voltage drops to between 11 V and 10.5 V the indicator begins to flash.

The portable VHF station is ready for operation after the antenna is screwed in place and microphone speaker plugged in.

When the ILL button is pressed, the panel lighting in the AR 4201 - ( ) comes on for approximately 10 to 20 seconds.

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Failure description

Unit type :Serial number :
Aircraft type :
Brief description of the failure :
.....
.....
.....
.....

Should the fault only occur sporadically, please answer the following questions :

The fault occurs after . . . . . minutes of operation.
The fault occurs under the following environmental conditions :
low temperature
high temperature
high humidity
vibration
The fault is engine speed-dependent and occurs above/below . . . . . rpm.
Should any problems arise, I may be contacted under the following adress :

.....
.....
.....

..... office: .....
..... private : .....

Servicing and operation of lead-acid batteries

CAUTION

Lead-acid batteries are to be charged immediately after use. Discharged lead-acid batteries are to be charged for approximately 16 hours at 1/10 of the rated capacity.

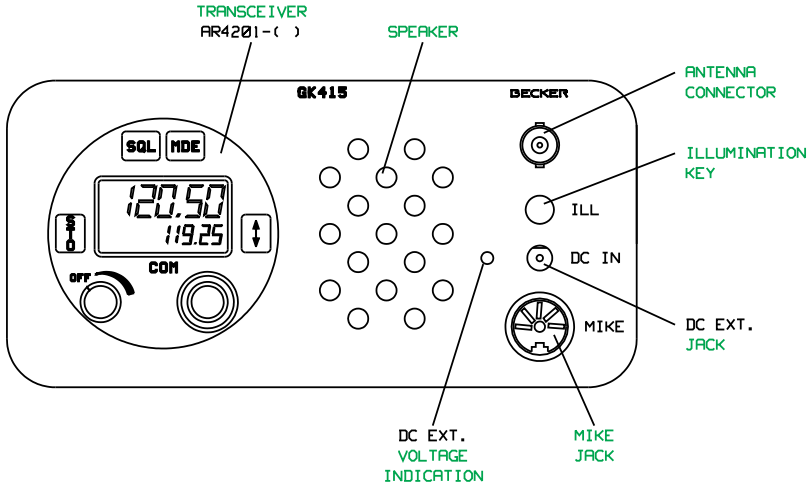
A few basic rules need to be observed in the handling of lead-acid batteries, to maintain their service life over several years.

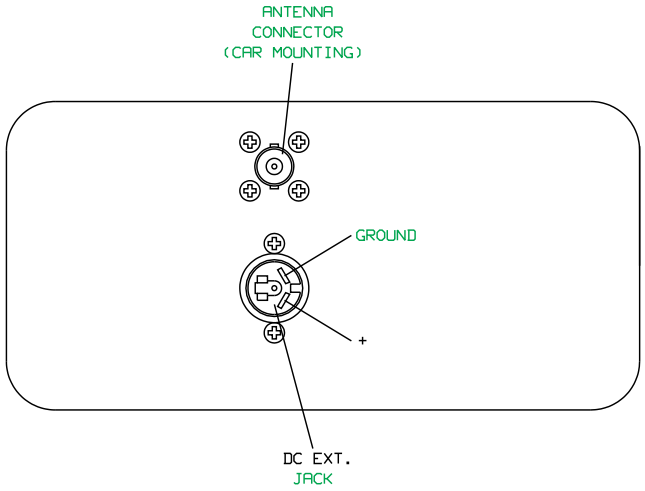
Lead-acid batteries should never be exhaustively discharged, i.e. collapse of the cell voltage must be absolutely avoided. A sudden progressive process of decay starts in the inside of the lead-acid battery immediately the charge is completely exhausted. With so-called starter batteries this can lead to complete destruction after just a few hours. A lead-acid battery which has been largely discharged must therefore be recharged without delay. It is best if lead-acid batteries retain a certain residual charge and are then immediately recharged to their rated capacity.

The manufacturers of lead-acid batteries also recommend that lead-acid batteries which are not in use should pass through a complete discharge/charge cycle once a month in order retain the capacity.

The VHF RT unit in the cabinet contains a voltage monitoring facility. If the operating voltage drops below 10.5 V, the frequency display begins to flash. When operating with a lead-acid battery, this is a signal to immediately recharge the battery.

Controls and indicators





Operating instructions

Connect the antenna and the mike to the corresponding connection jacks.

❑ Switching on the unit

Switch on the portable VHF station using the ON/OFF switch (rotate volume control clockwise).

CAUTION

The battery charger shall be operated at a distanced of at least 50 cm (maximum cable lengt) from the portable VHF-Transceiver, to avoid any interference generated by the battery charger .

Digital voltmeter (option)

Operation voltage indication	7V - 15V DC	0,1V

Repair instructions

If an equipment fault the unit may be sent to a Becker Dealer or the Becker customer service together with a description of the fault. The completed fault description shortens the repair times and hence lowers the resultant costs.

These operating instructions do not replace the equipment manuals listed below.

❑ Equipment manuals

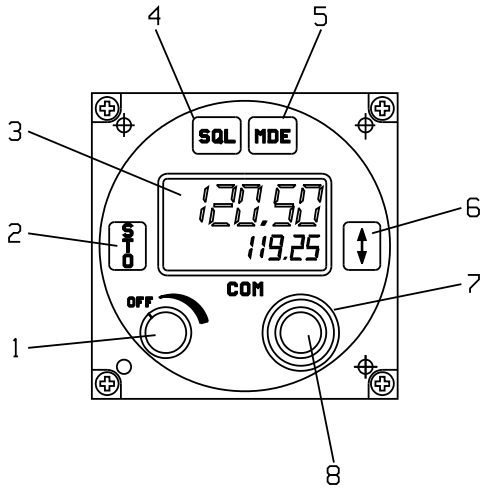
to be purchased from the manufacturer or Becker Dealer

Maintenance and Repair DV 365003.04, Becker order No.:885.843-071

Technical data

Supply voltage range	10 V. . . 32 V DC
Normal power supply voltage	13.75 V DC
Power consumption at 13.75 V	
- “Standby” reception mode	typ. 70mA
- Reception mode	typ. 500mA
- Transmission mode	typ. 2,5 A
Temperature range	- 20° C . . .+ 55° C
Dimensions (H x W x D)	270 x 115 x 80 mm
Weigth	3.5 kg
Frequency range	118.000 ...136.975 MHz
Number of channels spacing)	760 (25 kHz channel
Sensitivity	5 V for 6dB (S+ N) / N
Storage channels	99
Rated output power	
- for speaker operation	typ 3W at 4
- for headphone	typ 40mW at 600
Transmitter output	5W
Type of modulation	A3E
Modulation depth	70% - 99%
Frequency deviation	15ppm
Distortion m=85%/1000Hz	15%

Function of controls and indicators



1	ON/OFF switch, combi-ned with volume control	Adjustment of volume
2	Store key STO	Storage of set frequency or in Mode 2 a change between the channel selection mode and scan mode.
3	LC display 120.50 (top line)	Indication of active transmission/ reception frequency (active fre quency)
	Arrow (top line)	Transmission indication (transmission button is pressed)
	119.25 (bottom line)	Indication of preset transmission/ reception frequency (preset fre quency)

	CH 99 (bottom line)	Indicates the storage channel
	CH indication flashes (bottom line)	If the initiated storage operation is not completed by pressing the store key
	F (bottom line)	Indication that the selected storage channel is not occupied
	V 11.7 (bottom line)	Indication of supply voltage
	All indicating segment flashes	Supply voltage 10.5 V
	CS 99 (bottom line)	Indication of scan function
4	Squelch key SQL	Switching the squelch on or off (muting)
5	MDE key	Selection of mode
6	Exchange key	Mode 1: Exchange of preset frequency and active frequency Other modes : Reset to Mode 1 and acceptance of momentarily active frequen cy with this frequency being stored at the same time as the preset frequency
7	Frequency selector switch (outer rotary switch)	Switching the indicated frequency in 1 MHz steps or the storage channel upwards or downwards in steps of 10

❑ Basic settings in the service mode

The volume settings given in the service mode are set by the factory as basic settings using standard values. If reversion to the standard values is required, the portable VHF station must be switched off and switched on again by simultaneously pressing the STO and MDE keys.

❑ Ending of the service mode

The portable VHF station must be switched off to end the service mode.

❑ **Channel priority ON/OFF switch (option upwarts serial no.: 46)**

Call up function SF 18 using the MDE key. The following displays appears :

Top line	SF 18
Bottom line	CS channel number

Using the kHz (steps of 1) or MHz (steps of 10) switch, select the desired channel. Store the channel by pressing the STO key. Several channels can be selected on priority channels.

❑ **Squelch fast mode (upwarts serial no.: 46)**

Call up function SF 19 using the MDE key. The following displays appears :

Top line	SF 19
Bottom line	0 or 1

0 = Squelch fast mode OFF

1 = Squelch fast mode ON

Select the function using the kHz switch. Store the value by pressing the STO key.

8	Frequency selector switch (inner rotary switch)	Switches the indicator frequency in 25 kHz steps or the storage channel by 1 step in each case upwards or downwards, without carry over.

Operating instructions

❑ **Switching on the portable VHF station**

Switch on the portable VHF station using the ON/OFF switch (rotate volume control clockwise).

Both LCDs must show the numbers 188.88 flashing (unit test approximately 2 seconds). If the test is positive, the portable VHF station automatically switches to the mode which was selected before switch-off. If the test is negative, the LCD flashes for approximately 5 seconds. A fault report can be called up by pressing the store key. After approximately 5 seconds the portable VHF station automatically switches to the mode which was selected before switch-off.

The following fault signals are possible :

E1	Processor defective
E2	Synthesizer failed
E3	Fault in EE-PROM
E4	Controller (PIC) audio board defective

The various modes are comprehensively described in the annex to the general operating instructions.

❑ Transmit/receive mode

Set the frequency in the preset display and press the exchange key. Rotate the VOL control to the centre position.
Operate the transmit button and call the other station. Hold the microphone close to the lips for optimum speech transmission.

NOTES

- The triangle in the top line of the display indicates transmit mode. During transmission a protective circuit prevents a frequency change or frequency channel change even if the frequency selector switch is rotated. The keying functions on the control panel are also inhibited.
- If the error message E2 appears in the top line during operation, the synthesizer is not latching and further transmit / receive operation is no longer possible. Than the portable VHF station is to be send the next service station

CAUTION

If excessive feedback noises are experienced during transmission, the sidetone volume must be turned down on the transceiver (refer to manual of the installed transceiver).

Set the correct reception volume using the VOL control whilst the other station is answering.

Switch on the squelch (muting) (press SQL key again). Weak reception signals and reception noises are suppressed. The switch-on threshold of the squelch can be set in the service mode.

❑ Setting the dynamic mike input sensitivity

Call up function SF 16 using the MDE key. The following displays appears :

Top line	SF 16
Bottom line	00 bis 63 Standard value 32

The dynamic mike input sensitivity can be changed upwards or down-wards using the kHz switch. The set value is stored by pressing the STO key.

❑ Inhibiting the transmit mode for one or more memory channel (upwarts serial no.: 46)

Call up function SF 17 using the MDE key. The following displays appears :

Top line	SF 17
Bottom line	CS channel number

Using the kHz (steps of 1) or MHz (steps of 10) switch, select the desired channel for inhibiting the transmit mode. Store the channel by pressing the STO key. Several channels can be selected on priority channels. The letter T appears in the bottom line before CS. When the STO key is pressed again, the inhibiting transmit mode is canceled. The letter T is not appears in the bottom line before CS.

❑ Setting the “channel end” scanning range (if funtion SF8 activated)

Call up function SF 14 using the MDE key. The following displays appear :

Top line	SF 14
Bottom line	CS channel number

Using the kHz (steps of 1) or MHz (steps of 10) switch, select the end channel at which the scan function is to stop. Store the end channel by pressing the STO key.

❑ Entry of password to interlock the equipment configuration

Call up the SF 15 function using the MDE key. The following display appears :

Top line	SF 15
Bottom line	0

Set any 4-digit numerical code using the kHz (steps of 1) or MHz (steps of 10) switch. Store the numerical code by pressing the STO key.

NOTE

As soon as a password is given an 0 appears in the bottom line when the service mode is called up. The numerical code must then be input using the MHz or kHz switch. If the portable VHF station detects a false numerical code, it automatically switches to the last mode. If the password is to be erased or changed, this is done by calling up the service mode using the old password. The SF 15 function is then chosen and either an 0 is entered everywhere or the changed numerical code is entered.

NOTE

- Due to the carrier controlled squelch, the audio output is quieted with a certain delay after removal of an adequate RF-signal from the receiver input. This delay causes noise appearing in the audio output for some time. The presonce of this unwanted short time noise can be eliminated by activating the squelch fast mode in the service mode. With the squelch fast mode activated, it can occur that parts of a received message are blocked out and are not audible when the RF input signal is very weak.

❑ Jamming of transmit button

The portable VHF station is fitted with a protective circuit to protect against jamming of the transmit button or a short circuit on the key supply line. For continuous transmissions exceeding two minutes the protective Circuit automatically switches from transmission to reception. This avoids the switched channel being blocked.
In the event of a fault, this is only possible after the short circuit has been cleared or the transmit button released.

NOTE

- In order to be able to continue transmitting even with the transmit button jammed, the portable VHF station must be switched off and then back on again. After that the portable VHF station then continues to operate in the transmit mode for a further two minutes.

❑ Flashing of the LCD

If the power supply for the portable VHF station drops below 10.5 V, the display begins to flash. This flashing indicates, when operating on batteries for example, that the batteries require recharging. In prac-tice the display begins to flash in the transmit mode because this is when the power consumption is greatest. If the power supply again increases above 10.5 V, the flashing ceases.

Because the discharge curves of the batteries are very dependant on the type of battery, e.g. lead or nickel/cadmium accumulators, and the ambient temperature also influences the discharge curves, it is not possible to state precisely how long the portable VHF station continues to be fully functional after the LCD begins to flash.

When transmitting, the batteries can be completely discharged after a few transmission cycles but during reception functioning is still guaranteed in most cases for approximately 1 to 2 hours after the flashing begins.

❑ Erase stored frequencies

Call up function SF 12 using the MDE key. The following display appears :

Top line	SF 12
Bottom line	CH channel number

Select the channel to be erased using the kHz (steps of 1) or MHz (steps of 10) switch. The stored frequency is erased by pressing the STO key.

❑ Setting the “channel start” scanning range (if funtion SF8 activated)

Call up function SF 13 using the MDE key. The following displays appear :

Top line	SF 13
Bottom line	CS channel number

Select the starting channel, using the kHz (steps of 1) or MHz (steps of 10) switch, at which the scan function is to begin. The starting channel is stored by pressing the STO key.

❑ Inhibiting the frequency setting (channel selection only)

Call up function SF 10 using the MDE key. The following displays appear :

Top line	SF 10
Bottom line	0 or 1

Select the required function using the kHz key and store the function by pressing the STO key.

0 = Frequency setting not possible. The VHF station can only work on the frequencies stored in the individual channels.

1 = Frequency setting possible (standard setting).

❑ Inhibiting the frequency storage

Call up function SF 11 using the MDE key. The following display appears :

Top line	SF 11
Bottom line	0 or 1

Select the required function using the kHz switch and store the selection by pressing the STO key.

0 = The storage of frequencies in the individual channels is not possible. The portable VHF station can only work on the set frequency.

1 = Storage of frequencies in the individual channels is possible (standard setting)

❑ Operation of the various modes

The portable VHF station performs various functions which are covered by individual operating modes.
The mode is selected by briefly pressing the MDE key. If it is pressed for a long time (more than 1 second) this selects mode 1. It is also possible to change directly from modes 2 to 3 directly to mode 1 by pressing the exchange key.

Modes:

1 Standard mode (display of active and preset frequency), setting the preset frequency and storing frequencies in the storage channels.

2 Display of the storage frequencies in the storage channels or calling up the scan function.

3 Display of power supply voltage and active frequency.

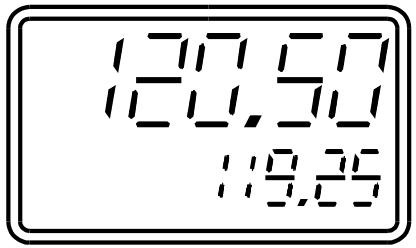
4 Service mode, for setting the equipment configuration.

NOTE

The portable VHF station automatically stores changes within two seconds, such as a mode or frequency change. This means that changes made immediately before switch off sometimes cannot be stored. Excepions are selective storage operations which are stored using the STO key. The automatic storage means that the previous mode is again displayed after switch on.

❑ Mode 1 (standard mode)

The last displayed active and preset frequencies appear in the LCD display.



The preset frequency (bottom line) is set using the MHz and kHz frequency selector switches.

When the exchange key is pressed, a change from the active to the preset frequency occurs. A further operation of the key cancels the frequency change.

Pressing the STO key in any mode initiates a store operation. CH and the last called up storage channel appear flashing in the bottom line. A different storage channel can be selected in steps of 1 using the kHz frequency selector. The MHz frequency selector enables storage channels to be selected in steps of 10. If a free channel is selected, one in which no frequency has as yet been stored, the letter F (free channel) appears in the bottom line before CH. The storage operation is ended by again pressing the STO key, which stores the active frequency displayed in the top line in the channel shown in the bottom line.

❑ Setting the temperature display in °C or °F

Not activated in the portable VHF station. SF7 is not displayed

❑ Switching on the scan function

Call up function SF 8 using the MDE key. The following display appears :

Top line	SF 8
Bottom line	0 or 1

Select the required function using the kHz switch and store the selection by pressing the STO key.

0 = scan function off

1 = scan function on

If scan function is not activated, than functions SF9, SF13 and SF14 are not displayed.

❑ Setting the hold time in the scan function (if funtion SF8 activated)

Call up function SF 9 using MDE key. The following displays appear :

Top line	SF 9
Bottom line	0.0 to 60.0

The hold time can be set as required between 0 and 60 seconds using the kHz switch. The set value is stored by pressing the STO key.

❑ Setting the IC level

Call up the SF4 function using the MDE key. The following displays appear :

Top line	SF 4
Bottom line	00 to 63

The IC level can be changed upwards or downwards using the kHz switch. The set value is stored by pressing the STO key.

❑ Calibrating the temperature sensor

Not activated in the portable VHF station. SF5 is not displayed

❑ Setting addressable storage locations 1 to 99.

Call up the SF6function using the MDE key. The following display then appears :

Top line	SF 6
Bottom line	1 to 99

The number of the storage channel between 1 to 99 can be selected as required using the kHz switch and stored by pressing the STO key. If the number of storage channels is limited and if channels outside the limited area have already been used, these can no longer be called up. The data in the channels outside the area continues to remain stored and it can be resed at any time by lifting the restricted area.

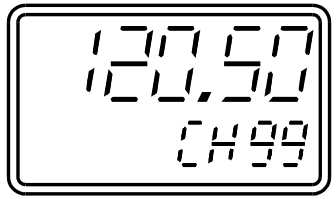
❑ Mode 2 (display of fixed frequencies in the various channels)

❑ Channel selection mode

NOTE

If in mode 2 the scan function is switched on in the service mode, no storage operation can be activated in this mode.

Select mode 2 using the MDE key. The last indicated storage channel appears in the bottom line of the LCD and the stored frequency is shown in the top line. The portable VHF station is ready to transmit and receive on this frequency.



The required channel can be selected using the kHz frequency selector (steps of 1) or the MHz frequency selector (steps of 10). If a free channel is selected in which no frequency has as yet been stored, the letter F (free channel) appears in the bottom line before CH.

Exit from mode 2 is achieved either by pressing the MDE key or the exchange key. When the exchange key is operated, the active frequency is stored as a preset frequency and a direct changeover to mode 1 is made. This means that the previous active frequency is available as a preset frequency in mode 1.

❑ Scan function

If the scan function is activated in the equipment configuration, pressing the STO key changes from the channel selection mode to the scan function. In the scan function, the frequency appears in the top line of the display and the associated channel with the preset CS is shown in the bottom line.

In the scan function, either all the occupied storage channels or a required range of storage channels can be scanned. The scanning range is specified in the service mode. The various storage channels are scanned in short intervals. If the microprocessor finds a carrier in one of the channels, it holds a short on this channel and checks whether an evaluatable signal is present. If no evaluatable signal is present, it switches to the next channel and then reverts to the short intervals (milliseconds range).

In the event of an evaluatable reception signal being received the portable VHF station remains on the storage channel until an evaluatable reception signal is no longer present. After a hold time 0 to 60 seconds (can be set in the service mode) the scanning of the storage channels at short intervals begins again. The set squelch level is the criterium for an evaluatable reception signal, regardless of whether the squelch is activated or not.

If the portable VHF station is equipped with channel priority, this function can be switched ON or OFF in service mode SF 18

NOTE

If an adequate signal is required on the priority channel with option channel priority switched ON, the portable VHF station automatically leaves the SCAN mode and is ready for transmission and receive on this channel. For return to the SCAN mode, again press the STO key.

❑ Setting the sidetone level

Call up the SF 2 function using the MDE key. The following displays appear :

Top line	SF 2
Bottom line	00 to 63 Standard level 32

Using the kHz switch, the sidetone level can be altered upwards or downwards. The set value is stored by pressing the STO key.

❑ Setting the audio auxiliary level

Call up the SF 3 function using the MDE key. The following displays appear :

Top line	SF 3
Bottom line	00 to 63 Standard level 63

Using the kHz switch, altered the audio auxiliary level upwards or down-wards. The set value is stored by pressing the STO key.

- In the service mode the portable VHF station operates indepen-dent-ly of the settings on the control panel, on the frequency which was last set as the active frequency. Wenn the PTT-Key is pressed in the service mode, the display indicates in the top line the active frequency
- The user can interlock his equipment configuration settings with the aid of a password. The portable VHF station is delivered from the factory without a password. Section SF15 “Entry of password for interlocking the equipment configuration” describes how to enter a password.

❑ Setting the squelch threshold

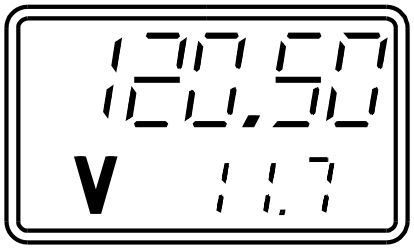
If function SF 1 is called up, the following displays appear :

Top line	SF 1	
Bottom line	00 to 200	Standard level 100

By means of the kHz switch, the squelch threshold can be altered upwards or downwards in steps of 5. The set value is stored by pressing the STO key.

The scan function is terminated by pressing the STO key. The portable VHF station then begins to operate again in the channel selection mode the CS in the bottom line goes out and CH appears. Exit from mode 2 is accomplished in the same way as described in the channel selection mode.

❑ Mode 3 (indication of supply voltage)



The supply voltage is continuously measured. Indication occurs only in mode 3. The mode is selected by briefly pressing the MDE key once or several times (corresponding to the previous state) the active frequency on which the VHF station is ready for operation is shown in the top line and the measured voltage is displayed in the bottom line.

The active frequency (top line) can be changed using both frequency selector switches. A storage operation is activated using the STO key. This procedure is described in Mode 1.

Exit from mode 3 is achieved either by pressing the MDE key or the exchange key. When the exchange key is pressed the active frequency is stored as a preset frequency and a direct change to mode 1 occurs. This means that in mode 1 the previous active frequency is available as a preset frequency.

Service mode (equipment configurations)

CAUTION

The service mode is meant to enable to set the equipment configuration.

The following settings can be changed or set :

SF 1 Setting the switch-on threshold of the squelch

SF 2 Setting the sidetone volume

SF 3 Setting the AF auxiliary volume

SF 4 Setting the IC volume

SF 5 Calibrating the temperature sensor
(Not activated in the portable VHF station)

SF 6 Setting the addressable storage channels

SF 7 Setting the temperature display in °C or °F
(Not activated in the portable VHF station)

SF 8 Switching on the scan function

SF 9 Setting the hold time after completion of a call in the scan mode

SF10 Inhibiting the frequency setting (channel selection only)

SF11 Inhibiting the frequency storage

SF12 Erasure of stored frequencies

SF13 Setting the “channel start” of the scanning range

SF14 Setting the “channel end” of the scanning range

SF15 Entering a password to interlock the equipment configuration.

SF16 Dynamic mike input sensitivity

upwarts serial no.: 46

SF17 Inhibiting the transmit mode for one or more memory channel

SF18 Channel priority ON/OFF switch (option)

SF19 Squelch fast mode

NOTE

The equipment configuration SF1 - SF3 and SF16 settings given in the service mode are set by the factory as basic settings using standard values. If reversion to the standard values is required, the portable VHF station must be switched off and switched on again by simultaneously pressing the STO and MDE keys. This does not overwrite the password.

❑ Calling up the service mode

Switch off the portable VHF station. Hold the mode key (MDE) pressed and at the same time switch on the unit. The portable VHFstation switches to the service mode without a unit test. SF1 appears in the top line and the switch on threshold of the squelch is shown on the bottom line.

NOTES

- The settings SF1 to SF19 are selected in steps by briefly pressing the MDE key in the service mode. If the MDE key is pressed at the end of the setting (SF19), the setting SF1 then appears. If a direct return to the SF1 setting is required the MDE key must be pressed for at least one second.